CLAIMS

1. A fiber grating comprising a core where a grating is written, a cladding for covering the core, and a coat layer for coating an outer face of the cladding,

wherein the coat layer is made from a UV transmitting resin and has a characteristic of transmitting UV at least of a specific wavelength band used for writing the grating and of curing by absorbing UV of a shorter wavelength band or a longer wavelength band than the specific wavelength band, and

the grating is written by irradiating the core with the UV of the specific wavelength band through the coat layer.

2. The fiber grating of Claim 1,

wherein the core is co-doped with Ge and Sn, and

a concentration of Ge is substantially the same as a concentration of Ge included in a core of another optical fiber to be connected to the fiber grating.

3. The fiber grating of Claim 1 or 2, further comprising a secondary coat layer for coating an outer face of the coat layer,

wherein the secondary coat layer is made from a material having a negative coefficient of linear expansion.

4. The fiber grating of Claim 1,

wherein the coat layer is formed from a single coat film with a thickness of 30 μm or more.

5. The fiber grating of Claim 2,

wherein the core is further doped with Al.

6. A method of fabricating a fiber grating comprising the steps of:

fabricating a glass fiber structure including a core where a grating is to be written and a cladding for covering the core;

coating an outer face of the glass fiber structure with a coat layer of a UV transmitting resin; and

writing the grating in the core by irradiating the core with UV through the coat layer,

wherein the coat layer has a large thickness for attaining a mechanical strength characteristic equivalent to that of a coated fiber to be connected to the fiber grating, and

the UV is obtained by using solid laser and irradiates the core at an irradiation energy density within a range between 1.5 and 4.0 kJ/cm^2.

7. The method of fabricating a fiber grating of Claim 6, wherein the UV has a wavelength of 250 nm through 350 nm.

8. The method of fabricating a fiber grating of Claim 6 or 7,

wherein the coat layer is formed by a single coating method in a thickness of 30 μm through 50 μm.

9. The method of fabricating a fiber grating of Claim 6 or 7,

wherein the step of writing the grating includes steps of:

placing all the coat layer, the cladding and the core in a position between a cylindrical lens and a focal point of

the cylindrical lens and within a beam pattern of the UV converged toward the focal point by the cylindrical lens; and

irradiating the core with the UV through the cylindrical lens.

10. The method of fabricating a fiber grating of Claim 6, wherein, in the step of writing the grating, an outer face of the coat layer is internally in contact with an outer edge of a beam pattern of the UV.

11. The method of fabricating a fiber grating of Claim 6, wherein the core is loaded with hydrogen before irradiating with the UV.

12. The method of fabricating a fiber grating of Claim 6, wherein the core is co-doped with Ge and Sn.

13. A method of fabricating a fiber grating comprising:

a tension application step of causing tensile strain along a fiber axial direction by previously applying a tensile force along the fiber axial direction to a grating write portion of an optical fiber to be fabricated into a fiber grating;

an irradiation step of writing the grating with a predetermined grating pitch along the fiber axial direction in a core of the optical fiber by irradiating the optical fiber with UV with keeping the tensile force applied in the tension application step; and

a tension release step of shifting the grating pitch of the grating written in the core toward a shorter wavelength by

releasing application of the tensile force after the irradiation step.

14. The method of fabricating a fiber grating of Claim 13, wherein the optical fiber is a coated fiber obtained by coating a non-coated fiber including the core and a cladding with a coat layer of a UV transmitting resin.

15. The method of fabricating a fiber grating of Claim 13, further comprising a screening step of conducing a screening test on the grating write portion by applying a predetermined tensile force to the optical fiber after the tension release step.

16. A method of fabricating a fiber grating, by using a fiber grating fabrication apparatus including a UV irradiation system for irradiating, with UV, an optical fiber to be fabricated into a fiber grating and a tension applying mechanism for applying a tensile force in a fiber axial direction to the optical fiber, comprising:

an irradiation step of writing a grating along the fiber axial direction in a core of the optical fiber by irradiating the optical fiber with UV by using the UV irradiation system; and

a screening step of conducting a screening test on a portion where the grating has been written by applying a predetermined tensile force to the optical fiber by using the tension applying mechanism after the irradiation step.

17. A fiber grating fabrication apparatus comprising:

a UV irradiation system for writing a grating with a predetermined grating pitch along a fiber axial direction in a core of an optical fiber to be fabricated into a fiber grating by irradiating the optical fiber with UV; and

a tension applying mechanism for causing tensile strain along the fiber axial direction by temporarily applying a tensile force to a portion of the optical fiber irradiated with UV by the UV irradiation system.

18. The fiber grating fabrication apparatus of Claim 17, wherein the tension applying mechanism includes:

a pair of fixing means for respectively fixing two portions of the optical fiber away from each other along the fiber axial direction and sandwiching the portion of the optical fiber irradiated with UV by the UV irradiation system; and

moving means for forcedly moving at least one of the pair of fixing means along the fiber axial direction away from and toward the other of the pair of fixing means.

19. The fiber grating fabrication apparatus of Claim 18, wherein the pair of fixing means are winding reels each for fixing the optical fiber, with frictional resistance against the optical fiber, by winding the optical fiber around an axis thereof perpendicular to the fiber axial direction, one of the winding reels to be moved by the moving means being rotatably supported around the perpendicular axis in one position along the fiber axial direction, and

the moving means is a motor for forcedly rotating one of the winding reels to be moved by predetermined revolutions with the optical fiber wound.

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